

## 論文の内容の要旨

論文題目 IMPROVING EVERYDAY GRAPHICAL USER INTERFACE OPERATIONS  
(日常的なグラフィカルユーザインタフェース操作の改善)

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Graphical User Interfaces (GUI) based on Windows, Icons, Menus, and Pointers (WIMP) are now a global standard and we use them literally all day, everyday. They are widely considered to be superior to command-based interactions. However, many Fitts' law-related usability issues remain unsolved such as the difficulty in pointing distant object on a large screen. Dozens of attempts have been made to address these problems, including introduction of novel devices, novel GUI widgets, and intelligent algorithms to automate frequent operations. In contrast to these attempts to introduce completely new methods, we focus on partial modifications of existing GUI interactions. This is because small improvements can bring significant benefit to many people while minimizing developers' overhead to redesign a new system and users' overhead to learn it. In this thesis, we propose to exploit extra spatial information such as the location and movement of the mouse cursor to enrich standard GUI operations. By exploiting these previously not-intensively-used resources, we can enrich interactions with minimum modification to the familiar operations. Specifically, we propose the following four interaction techniques. 1) considering the direction of cursor movement to improve cascading menu traversal, 2) introducing throw-and-catch interaction to make drag-and-drop suspendable, 3) considering the position of the cursor to enhance wheel-based scrolling, and 4) introducing multiple distributed cursors to cover wide screens. We describe the design, implementation, and evaluation study of these techniques. We also present design implications based on our study. We hope our experience will lead to further improvements of standard GUI operations and provide valuable information for designing new interaction paradigms.